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an article entitled "Horses of the Plains." Mr. Kennan, in an article entitled "The Life of Administrative Exiles," presents some of the most astounding facts gathered by him in Siberia. The article is without illustrations. The writer says in introducing it, that to present a large number of closely related facts concerning this branch of the subject in the chronological order in which they were obtained would be to scatter them through half a dozen articles, and thus deprive them of much of their cumulative force and significance. He therefore groups these facts in a single paper, which necessitates a brief interruption of the narrative, and an omission, for a single number, of the illustrations. This, he remarks, enables him to deal broadly and comprehensively with one of the most interesting and important phases of the exile system. In "Topics of the Time" are discussed "Annexation, or Federation?" "Separate Municipal Elections," the question "Are We Just to our Architects?" and "A Crisis in the Copyright Agitation." "Open Letters" deal with "Lawyers' Morals," the "Life of Lincoln," and "The Mother's Right."

— In the January "Popular Science Monthly" there are four illustrated articles, one of which, "The Guiding-Needle on an Iron Ship," opens the number. In this paper, Lieut.-Commander T. A. Lyons, U.S.N., tells why the various masses of iron on shipboard interfere with the working of the compass, and explains how the trouble is remedied. "House-Drainage from Various Points of View," is the title under which Dr. John S. Billings, U.S.A., describes, with illustrations, the present condition of this complex problem. Very timely and interesting is Mr. W. H. Larrabee's copiously illustrated paper on "Sea-Lions and Fur-Seals." Two articles that will interest teachers and parents are "The Sacrifice of Education," a protest against the abuse of examinations; and "Inventional Geometry," by E. R. Shaw, which tells how geometry has been made a pleasure to pupils using the book prepared by Herbert Spencer's father. Eighteen drawings made by boys and girls in working out the problems are inserted. "Town-Life as a Cause of Degeneracy," is the subject of an instructive paper by G. B. Barron, M.D. The nature of "Genius and Talent" is described by Grant Allen in his peculiarly happy vein. W. D. Le Sueur contributes a strong article under the title "Science and its Accusers," in which he affirms that science is simply truth, and that, while men and theories may properly be criticised, opposition to science is absurd and vain. Professor Langley's address on "The History of a Doctrine" is concluded in this number. "The Suanetians and their Home," is an account, by D. W. Freshfield, of an interesting people dwelling in the Caucasus region. Some additional facts concerning "Gauss and the Electric Telegraph" are given, and the subject of the usual sketch and portrait is Rev. Moses Ashley Curtis, the North Carolina botanist. Professor C. H. A. Bulkley, D.D., contributes a letter on "The Relation of Altruism to Egoism," criticising Mr. Smiley's recent article. The "Editor's Table" deals with "The March of Practical Science" and "The Abuse of Examinations;" and the "Miscellany" and "Notes" are varied and instructive.

— The tenth volume of the "Proceedings of the United States National Museum" has just been issued. The signatures composing the volume were issued from April, 1887, to October, 1888. Like the preceding issues, the volume contains primarily essays on zoological subjects, although others are not wanting. The greater part of the work is occupied by papers prepared by the scientific corps of the National Museum, while others treat upon the collections of the museum. In an appendix a catalogue of the contributions of the section of graphic arts to the Ohio Valley Centennial Exposition at Cincinnati is given.

— The fifth volume of the "Mineral Resources of the United States," by David T. Day, has just been issued by the United States Geological Survey. It covers the calendar year 1887. The statistical tables contained in the former volumes have been brought forward, but repetition of descriptive matter has been avoided wherever possible. The result of Professor Day's careful investigations shows an aggregate value of \$538,056,345 for the mineral industries of the United States. This is nearly \$73,000,000 more than the product in 1886, and considerably more than \$100,000,000 in

excess of the year 1885. Of many items which have contributed to this result, all the metals increased in quantity, except gold and the minor metal nickel, and nearly all increased in price. The significance of this is seen in the increased production of the fuels necessary for reducing these metals and preparing them for use. All of these fuels, including natural gas, show a marked increase. The value of building-stone increased considerably, but this apparent advance is principally due to a more careful canvass of this industry than has been possible in previous years. Professor Day does not consider it probable that the great total recorded for 1887 will be equalled in the present year.

— "A Course of Mineralogy for Young People" (Agassiz Association course) is published by G. Guttenberg, teacher of natural sciences in the Erie High School, Erie, Penn. In this course it has been attempted to present the study of stones in such a manner that any bright boy or girl over twelve years of age can, without the aid of a teacher, become a fair mineralogist, being able to examine and determine all of the more important minerals, including the ores of the useful metals.

— The new edition (1889) of "The Electricians' Directory and Handbook" is in preparation. It is published at "The Electrician" office, 1 Salisbury Court, Fleet Street, London, E.C.

— An arrangement has been made by which the "Political Science Quarterly" and "The New Princeton Review" are consolidated. The publishers of the "Political Science Quarterly" (Ginn & Co.) have purchased "The New Princeton Review," and the latter journal will be merged into the former. The political and economic questions to which "The New Princeton Review" has devoted so much of its attention, and which are engrossing more and more the attention of the public, will form, as heretofore, the special field of the "Political Science Quarterly." The point of view and method of treatment which have won for both journals such cordial recognition and such extensive support will remain unchanged. Certain features of "The New Princeton Review" which have specially commended themselves to the public will be incorporated in the "Political Science Quarterly;" and as Professor Sloane, the editor of "The New Princeton Review," will be associated in future with the work of the "Political Science Quarterly," the cause of sound politics can only gain by this union of forces.

— Laidlaw Bros. & Co., 137 West 41st Street, New York City, have just issued "The Declaration of Independence and the Constitution of the United States, in German, French, and English, in Parallel Columns," translated by A. H. Laidlaw, jun.; French and German revised by Professors Hellmrich, Schoeder, and Fezandíé. The translations have been carefully made. Historical notes have been interspersed throughout the work, and an appendix supplies interesting tables on matters of permanent importance. Blank pages have been added for the reception of grammatical and historical notes, for the insertion of appropriate clippings from periodicals, and for the collection of references to interesting pages of other works.

LETTERS TO THE EDITOR.

*.*Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

The Soaring of Birds.

To the tests proposed in "Science" (Dec. 7, pp. 267, 268) for Mr. Gilbert's ingenious hypothesis that birds, in soaring, utilize the varying velocities and directions of the horizontal air-currents at different levels, one might perhaps add this: that the inclined planes of the circles described should be observably related to the direction, etc., of the wind at the earth's surface, and of the cloud-drift above. For instance: if the upper current, relatively to the lower, was from the north, we might expect the higher side of the circle to be the north side, or else to be that side along which the bird was flying southward.

The action suggested would clearly be to some extent *efficient*; but would it also be *sufficient*? Can the gradients of velocity, etc., from level to level in air-currents far above us, be rapid enough to give the bird more than a slight assistance, although perhaps he would still avail himself of even that little help? For here is much more than "friction" to be overcome. If a hawk, weighing a pound or more to every square foot of effective wing and tail surface, would fall through the air with outspread motionless wings ten miles an hour, which I believe to be a low estimate, then, to sustain his weight without muscular effort, his horizontal velocity relative to the surrounding air should be not less than fifteen miles an hour. Can it be that air-currents hundreds of feet from the earth, and only a few yards apart, often differ in velocity so much as that? And yet I have seen no other theory that could in the least explain the prolonged soaring of birds, if, indeed, their wings do remain motionless. Much has been said of late, in "Science" and elsewhere, of the locking of certain wing-joints: but this admirable contrivance for relieving muscular fatigue is quite irrelevant to the present problem; for, as Mr. Gilbert has recognized, it provides not a foot-pound of that actual work which, to prevent a fall of ten miles per hour, must be expended at a rate of thirty mile-pounds per hour if the bird weighs three pounds.

A naval officer, whose name I forget, once told me of an observation of his own, which, if confirmed, would remove all difficulties. Standing on deck in mid-ocean in a stiff breeze, he observed certain sea-birds hovering near him with apparently unmoving wings, though holding their own against the wind. But when they came within a few yards, he could see that the outspread wings had in reality a rapid motion of very small amplitude, almost a mere tremor. His impression was, that, though the wings had not sufficient play to present the whole wing edgewise to the air during the up-stroke, and flatwise during the down-stroke, yet the individual wing-feathers might be doing this, their vanes automatically separating and turning edgewise, opening like valves or like slats of a blind, as the wing rose, and closing up again, as it fell, by the action of the air itself. Some such action of the feathers would greatly aid this kind of flight. It is for naturalists to say how well they are adapted to it, and whether such flight might be possible while the wing-joints remained locked, and whether it might therefore be sometimes a restful change for the bird.

J. E. OLIVER.

Cornell University, Dec. 19.

Cucullaris Propatagialis in Oscinine Birds.

SOME time ago ("Science," ix. 1887, pp. 623, 624), Dr. R. W. Shufeldt announced the alleged discovery in the bird-wing, of a muscle well known as *Cucullaris propatagialis*, as being particularly characteristic of the suborder *Oscines* (or, as I call them, the superfamily *Passeroideæ*), special stress being laid on its taxonomic value in distinguishing the latter from the mesomyodian *Passeres*. In a subsequent number of "Science" (x. 1887, pp. 70-72) I demonstrated that the muscle in question is particularly well developed in parrots and woodpeckers; and I also stated that I had found it, though in a rudimentary state, in some of our typical mesomyodian *Passeres*, notably in *Tyrannus tyrannus*.

Through the courtesy of Mr. Frederic Lucas, I have since been enabled to dissect a fresh specimen of the Nepal Hill-Myna (*Gracula intermedia*), a sturnine bird from India. I found the *Cucullaris propatagialis* quite as rudimentary as in the *Tyrannus* alluded to. As *Gracula* undoubtedly belongs to the *Oscines*, it has been fairly demonstrated that the muscle in question is neither peculiar to the *Oscines*, nor especially characteristic of them.

In looking further into the literature, I find, also, that Fürbringer has recorded the same muscle as being rudimentary in the following oscinine birds, — *Lamprotorornis insidiator*, *Pastor roseus*, *Myiagra carulea*, *Ixos chrysorrhoeus*, *Copsychus macrurus*, and *Turdus pilaris*, — while in many others he found it but very feebly developed.

It is evident, therefore, that this variable muscular slip has no taxonomic value whatever in the direction indicated by Dr. Shufeldt. I even doubt whether it will be found of much service in defining trenchantly even families or smaller groups, since every

possible gradation between the rudimentary stage and the most highly developed condition seems to occur within the same group of unquestionably nearly related birds.

LEONHARD STEJNEGER.

Smithsonian Institution, Washington, D.C.,
Dec. 20.

Answers.

39. ORIGIN OF FISH IN ISOLATED PONDS. — If no one else will answer Mr. C. B. Palmer's question, let me point out that nothing seems simpler than that birds, lighting on the edge of first one pond, then another, should carry on their feet the eggs, larvæ, or whatever it may be, of one to the other. In digging wells in a quite desert region in Arizona, many miles from other wells, I was at first surprised to find them peopled after a short time with animals (frogs, if I forget not) which could not possibly have hopped or crawled from the nearest water, across the burning sand in mid-summer, with the thermometer rising above 115° F. But I soon saw the above easy explanation.

HENRY M. HOWE.

Boston, Dec. 22.

40. FELSPAR, OR FELDSPAR? — The note on the spelling of the word "feldspar," in "Science" of Dec. 14, is satisfactory with the exception of its closing sentence, which says that the form "felspar," although wrong, had been so long employed that "no one who prefers it can be criticised for using it." It should be added to this, that all other nations except Great Britain and her colonies, and also that ninety-nine hundredths of all mineralogical literature, spell the word with the *d* (or with the substitute *t* if the language requires it), and they do so because this is etymologically right; that the English drop the letter because the error in Great Britain has been persisted in until it has become *English*; and that such national prejudice is not a legitimate ground for scientific action even in Great Britain. Years since, the writer, thinking, like many others, uniformity in scientific nomenclature very desirable, sent a short paper, giving the British history of the word, to the "London Philological Magazine," which was accepted, and published anonymously as was requested. But national prejudice proved to be superior to all other considerations. In this country the prejudice has no right to a place, and the transplanting of its effects should not be allowed without a protest.

J. D. D.

41. THE "SUPERNUMERARY MOLAR" IN MAN. — As a partial reply to Query 41 in "Science" of Dec. 7, permit me to state that Dr. Shufeldt will find in skull No. 1327, of the Morton collection in the Philadelphia Academy of Natural Sciences, the finest specimen extant of molars posterior to the third or "wisdom" teeth. It is some years since we saw it, and then "as through a glass" only; but our recollection of it is that the superior fourth molars are quite through the alveolar process, while the inferior are just seen from above in their course to the surface. The superior fourth molars are not "peg-like," but molar-like, though smaller than their neighbors. The specimen is Australian. We have a personal acquaintance who has eighteen teeth in the upper jaw; the "extra" teeth, one on each side, posterior to the third molar or "wisdom" teeth. Like Dr. Shufeldt's specimen, these are "conical, peg-like," as to form of crown. According to dental writers, the African races seem specially favored in this matter. For the best account of this structure in man (assuming it to be "supernumerary"), reference is made to the late Dr. M. S. Dean's translation of Magitot and Segros' "Dental Follicle," in which it is made to appear that the setting of an epithelial structure, and the enamel organ, determine the fact and position of the future tooth. The same process is made to account for "supernumerary" teeth elsewhere in the maxillæ, the anterior part of the upper being particularly favored. As to its significance, facts are accumulating that seem to point to the weeding-out of the third molar or "wisdom" tooth, the number and importance of the facts being directly as civilization. Such being the case, is it unreasonable to suppose this occasionally-cropping-out fourth molar other than a reversion to a past type, and to a time in the history of man when mastication was the primary, and not as now, in the civilized world at least, a secondary function?

L. E. J.